WATER SOFTENER
WITH MICROPROCESSOR

INSTALLATION & OPERATING INSTRUCTIONS

Model : **AST1052TMP-960**
Serial No : **……**

Manufacturer and Supplier of

FILTRATION & WATER TREATMENT PRODUCTS
for commercial, industrial and residential application

Telephone: (07) 3219 2233 Facsimile: (07) 3219 2266
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CABINET STYLE MICROPROCESSOR WATER SOFTENER PERFORMANCE DATA SHEET

Automatic Model No.	Capacity & Salt Dosage		Recommended Maximum Service Flow Rate		Pipe Size		Resin Volume	Approx. Shipping Weight (kg)	Space Required
	Minimum	Maximum	Flow LPM		Inlet Outlet	Drain			W x D x H
	gram/kg	gram/kg	Cont.	Peak	mm	mm	Litres	Per Kg	metres
AS1052TMP-960	1820/3	3640/12	37	52	25	12	52	70	0.70 0.60 1.58

Peak flow not recommended for extended periods of time.

Brine Tank: Poly moulded construction complete with lid

Operating Pressure: 205 - 690 kPa

Temperature: 5^{o} x $50^{o}C$

Electrical: 240V 50Hz 3 watts maximum
Mains transformer provided

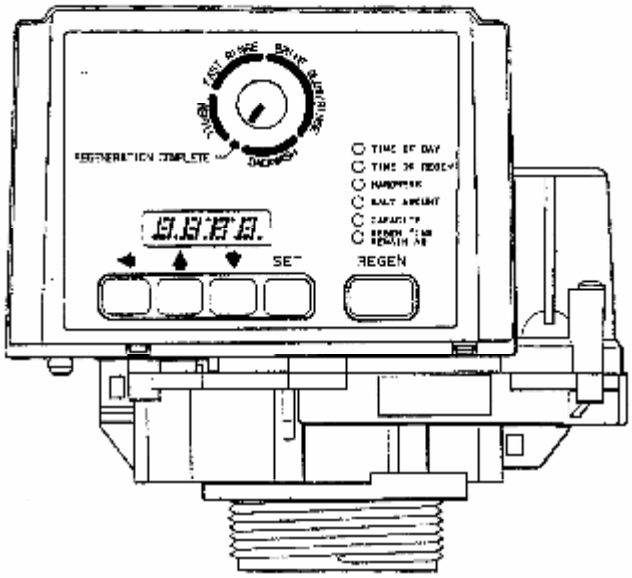
WARNING

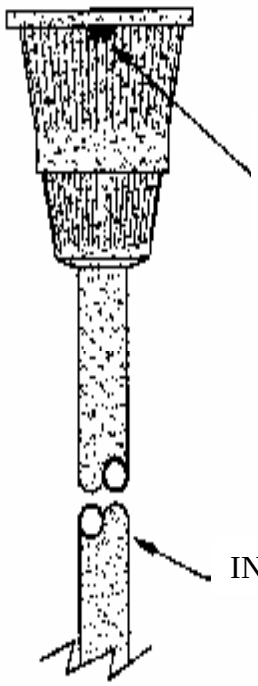
A pressure reduction valve should be installed in areas of high water pressure (above 690kPa)

A water hammer arrestor should be installed if water hammer prevails.

Caution: Do not use where water is microbiologically unsafe or with water of unknown quality.

FAILURE TO OBSERVE WARNINGS WILL VOID WARRANTY





ASSEMBLE TOP STRAINER
TO VALVE BODY
PUSH AND TWIST

INTERNAL RISER PIPE

NOTE:

ON A NUMBER OF SOFTENER MODELS AND FILTERS IT IS NECESSARY TO PACKAGE THE VALVE WITH THE TOP STRAINER SUPPLIED LOOSE. IT IS IMPORTANT THAT THIS STRAINER IS ASSEMBLED TO THE VALVE DURING INSTALLATION.
THE LENGTH OF THE INTERNAL RISER PIPE IS FACTORY ADJUSTED FOR THE TANK SIZE PROVIDED.

DO NOT SHORTEN THIS PIPE UNDER ANY CIRCUMSTANCES

MODEL AST1052TMP-960 SOFTENER

THE MICROPROCESSOR CONTROL WILL REQUIRE BASIC DATA PROGRAMMING TO SUIT THE WATER HARDNESS AND DESIRED UNIT CAPACITY

IMPORTANT: IT IS ESSENTIAL THAT YOU READ THE GENERAL CONDITIONER INFORMATION AND CONTROL SETTINGS OF THIS MANUAL BEFORE ATTEMPTING TO SET THE FUNCTIONS OF THIS UNIT. THE DEALER OR AGENT CAN SUPPLY THE RECOMMENDED HARDNESS CAPACITY. HOWEVER DO NOT EXCEED THE MAXIMUM KILOGRAMS OF HARDNESS CAPACITY FIGURE IN TABLE 2.

SUGGESTED SALT SETTINGS

Table 2

Kilograms of Hardness Capacity	Kg of Salt
Minimum 1.82	3.5
2.5	6
3.0	8.5
Maximum 3.64	12

PROGRAMMING PARAMETERS

To be done at time of commissioning

Table 1

Parameter		Range of Values	Min. Increments	Programming For your Application	Units of Measure	Notes
Name	Description					
P1	Time of day AM or PM	1:00 to 12:59	1	Current time	Hour/ minute	Range depends on value selected for P13. Enter the current time.
P2	Time of day Of regeneration	1:00 to 12:59 AM to PM	1	2:00am	Hour/ minute	Range depends on value selected for P13. Skip this parameter to accept the default or enter a new time.
P3	Hardness of water	30 to 2500	1 10		Mg/l	Unit of measure depends on value selected for P12. Test water hardness and enter that value.
P4	Salt amount	01 to 25.5	0.5 0.1		Kilograms	Refer table 2. Factory set @ 12.5
P5	Capacity of unit	0.01 to 14.00	0.1 0.01		Kilograms	Enter the unit capacity. Factory set @ 3.8

NOTE: All other parameters have been factory preset - DO NOT CHANGE

INSTALLATION
OF
IBC TWO TANK WATER SOFTENER UNIT

FITTED WITH MODEL 255 VALVE/960 CONTROL

Check the equipment upon arrival for damage or shortages and report same to our Office or Agent before starting.

Position the Softener and Brine Tank on a firm foundation, preferably concrete, with sufficient space for operation and maintenance.

STEP 1 Make sure the softener tank is empty and clean. Remove brine tank lid and remove resin and control valve.

STEP 2 Install the distributor tube in the softener tank, check the height in relation to top of softener tank. (Approximately 25mm above the top of the tank).

STEP 3 Place a plastic cap over the end of the distributor pipe. A clean rag or plastic bag will suffice if plastic cap is not available - **NO** media must enter distributor pipe.

STEP 4 Place a with mouth funnel in the mouth of the tank and load the resin and fill with water to within 50mm of the top. The resin **must not** be allowed to be spilled on the floor as it is very slippery and dangerous to walk on.

STEP 5 Clean top of neck and threads of all traces of resin. Remove the plastic cap fitted in Step 3 taking care not to raise the distributor pipe. **NEVER** shorten the length of the distributor pipe.

STEP 6 Unpack control valve, check that tank 'O' ring is in place. Screw in top strainer if not fitted. Fit control valve to softener tank, screw down hand tight. Attach bypass valve if supplied and then thread adaptor nuts and pipe piece with the sealing gasket.

STEP 7 Connect inlet, outlet pipes and drain line to control valve as per Instruction Booklet.

STEP 8 Remove lid from brine tank, connect brine tube from air check assembly on control valve, to brine riser tube in brine tank. Then connect brine overflow drain line to waste trap.

STEP 9 Refer to Instruction booklet for start up procedure (page 23 "placing conditioner into Service")

STEP 10 Load two bags of 25kg high purity water softener salt into brine tank and replace lid.

STEP 11 To prevent the brine tank over flowing it will be necessary to maintain the salt level in the tank to that of the initial fill and replenish the salt after two regenerations with one bag of salt.

Table 3

MODEL	RESIN LITRES	BRINE TANK - SALT LOADING KG
AST1052TMP-960	52	50

255-960 MICROPROCESSOR CONTROL

CONDENSED PROGRAMMING INSTRUCTION SHEET

Note:
For a full understanding of your water softener we advise that the instruction manual provided with the softener should be fully read.

After the water softener has been fully installed with the correct amount of salt placed in the brine cabinet or external brine tank it will be necessary to program into the 960 microprocessor, two functions to suit local conditions. It will be necessary to know the 'hardness" of the water to be softened. If the water supply is from a municipal supply the hardness can be obtained from the local "water authority". If the water supply is from a bore or non-municipal supply then the total hardness would be found from the water analysis carried out when the softener was recommended.

- The following will have to be programmed into the control
  - ð Current time of day
  - ð Hardness – of your local water supply

- Plug transformer into main GPO.

- Push lead end into socket underneath the front of the valve on left hand side corner

- Check that the front dial camshaft position indicator (white line mark) is pointing to "REGENERATION COMPLETE" position.
  If not, turn power on at mains. The display will light up as "E r r 3" and the electric motor will automatically drive the dial and cam around to the regeneration complete position.

  What is now shown in the DISPLAY is an alternating "TIME OF DAY" and "CAPACITY" as indicated by a green light highlighting the relevant setting.

The clock function has been pre programmed as a 12 hour clock. Therefore if the current time of day is in the morning, follow the instructions below:

IF THE CURRENT DAY IS 'AM'

- To set the "TIME OF DAY"

  þ Wait till the green light moves to the "TIME OF DAY" position
  Immediately press "SET" button.

- The last digit will **blink** –

  Using the **ñ ò** buttons, key in the current *last minute* figure.

  Eg, AM 11.2**5** – Key in ‘5’

- Press the **ï** button - the first *minute* digit will **blink**.

  Using the **ñ ò** buttons, key in the current first *minute* figure.

  In example 11.**2**5 – Key in ‘2’

- Press the **ï** button – the *second hour* digit will **blink**.

  Using the **ñ ò** buttons, key in the current *second hour* figure.

  In example 1**1**.25 – Key in ‘1’

- Press the **ï** key – the *first hour* digit will **blink**.

  Using the **ñ ò** buttons, key in the first hour figure.

  In example, **1**1.25 – Key in ‘1’

  Now –

  If the time is 10am or after, key in “1” and press the “SET” button.

  If the time of day is before 10am, key in “0” and press the “SET” button.

  If there is a DOT under "PM" then press either of the UP/DOWN button once to remove the DOT and then press again to bring up the No. 1.

  DO NOT FORGET TO PRESS "SET" TO LOCK IN THE TIME.

IF THE TIME IS "PM"

- Wait till the green light moves to the "TIME OF DAY" position Immediately press "SET" button.

- The last digit will **blink** –

  Using the **ï** button, key in the current *last minute* figure.

  Eg, PM 03.25 – Key in '5'

- Press the **ï** button - the first *minute* digit will **blink**.

  Using the **ñ ò** buttons, key in the current first *minute* figure.

  In example 03.25 – Key in '2'

- Press the **ï** button – the *second hour* digit will **blink**.

  Using the **ñ ò** buttons, key in the current *second hour* figure.

  In example 03.25 – Key in '3'

- Press the **ï** button – the first hour digit will blink. Using the **ñ** button only keep on pressing slowly until a little dot appears in the top left hand corner of the display under 'PM' – if the display is blinking and shows '1' keep on pressing **ñ** button until ˙0 appears, the press "SET" button.

Note: If the actual time is after 10 PM then the **ñ** button would not be further pressed and the display left on ˙1.

Note: If when programming the figures in, the display reverts back to the green button moving between "time of day" and "capacity", it just means that you have taken too long to program the settings in. Do not worry all you need to do is to press the "SET" button when the green light is against the setting and start over inputting the figures in a bit faster.

Make sure at the end of programming that the "set" button is pushed.

- To input **"HARDNESS"**

Note: this program will only accept a figure rounded to the nearest "TEN". Eg for a hardness of say 183 the 190 will have to be programmed in the setting ie the next higher "TEN" number will have to be selected.

- Wait till the green light moves to the "TIME OF DAY" then using the **ò** button keep pressing till the green light moves down to "HARDNESS" then press "SET" button.

- The ten digit (second from the left) will blink, using the **ñ ò** buttons input the numeral required eg. 190 hardness input **9**

- Using the **ï** button select the next blinking digit and using the **ñ ò** buttons input the numeral required, eg. 190 hardness input **1**

- Using the **ï** button select the next blinking digit which normally should be zero '0' for most water harness if the display shows any other number other than zero then use the **ò** button to bring it back to zero and then press "SET".

The softener has now been programmed and can now go into service. However, it is advisable to check the settings in the program, wait till the green light moves to "TIME OF DAY".

- Check time of day is correct
- Press **ò** button to "TIME OF REGENERATION" 2:00 should be displayed
- Press **ò** button to "HARDNESS" the hardness figure that you put in should be displayed
- Press **ò** button "SALT AMOUNT" take note of the figure displayed. Refer to table 2 in the manual under "SUGGESTED SALT SETTING" the figure should correspond to the bottom number in the right hand corner, under "KG OF SALT" heading.
- Press the **ò** button to "CAPACITY" take note of the figure displayed again refer to table 2 and the displayed number should correspond to the number at the bottom number under "KILGRAMS OF HARDNESS CAPACITY".

Please note: When the display goes back to alternating the green light between "TIME OF DAY" and "CAPACITY" that the capacity display NOW will be different to what has just been checked, what is now displayed is the volume of water that the softener will pass in "CUBIC METRES" before regenerating. However, when using the **ñ ò** buttons to check this setting the microprocessor will display the "EXCHANGE HARNESS CAPACITY OF THE SOFTENER" and this can be modified if required, see the manual for full details.

It is recommended that the softener be now given a regeneration so as to pre-clean the resin bed. Before this is done proceed as follows:

- Turn power off
- Make sure inlet water to softener valve is “OFF”, outlet valve “OFF” and bypass open
- Verify that drain line is fitted and that there is an “AIR GAP” between the drain pipe and waste hole.
- Remove “VALVE COVER” by pushing the tab, (at rear of the cover at the left hand back corner) backwards
- The valve camshaft is now evident
  - Slowly turn the camshaft anti-clockwise so that the last two cams (at the far emd) are just riding on the two narrow brass ends are now pushed over to the right hand side. The valve is now in the “BACKWASH POSITION”
- Slowly open the mains inlet valve. Do not open fully, just enough that air and water will be discharged at the drain. When no more air is being expelled along with the water, close off the mains water inlet valve.
- Slowly turn the camshaft anti-clockwise till the white line in the round window comes around to the “REFILL” position.
- Turn on the “POWER”. The display will show ‘E r r 3” and the control will advance the camshaft by itself around to the “REGENERATION COMPLETE” position (this may take up to 5 minutes) and the “E r r 3” being displayed will then revert back to the “TIME OF DAY”/”CAPACITY” green light alternating.
- Once the display green light is alternating
  - Pour 10-12 litres of water into the brine tank or cabinet. This is an initial amount of water utilised for the <u>first</u> regeneration.
  - Open mains water inlet valve
  - Press the large “REGENERATION” button and hold for approximately two seconds
  - The green light will now be against “REGEN TIME REMAINING” which is the time that the softener is in the regeneration mode and will decrease till the softener completes the regeration. During this time the controls green light will alternate between “TIME OF DAY” and “REGEN TIME REMAINING”.

The softener will regenerate and the window display will then be at the “REGENERATION COMPLETE” position. During the process the brine tank or cabinet will be refilled with the correct amount of water necessary to dissolve the salt required.

- Open the outlet mains valve and close off the bypass valve and check the treated water at a tap for “HARDNESS” using the Yes/No tablets provided. Note: run the water for a few minutes to displace the initial untreated water remaining in the pipeline.

Series 255 Valve / 960 Control

Water Conditioning Control System
Installation, Operating and Maintenance Manual

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Safety

Caution
The plug-in transformer for this equipment is rated for indoor use only.

Warning
Never attempt o work on this control while standing in or near water without disconnecting electrical power to the control.

Introduction

The Model 960 Control provides sophisticated, demand-based water conditioning by incorporating a microprocessor and a water meter to electronically monitor the amount of water used daily. Each day, at Time of Regeneration, the control determine if the capacity remaining is sufficient to provide conditioned Water for the next day. If the remaining capacity is too small, the control automatically regenerates the resin bed.

If water usage changes, the computer automatically compensates for the change and regenerates as needed. Regeneration based on actual water usage. The control provides efficient, trouble-free, uninterrupted soft water luxury.

The Series 255 valve combines design simplicity with glass reinforced NORYL* plastic construction to provide an uncommonly reliable appliance.

If maintenance becomes necessary, the Model 960 Series 255 water Conditioner System offer a unique "separation" capability for quick repairs.

NORYL is a trademark of GE Plastics.

Special Features

- **Memory Retention.** During a power outage, critical operating information in the control's memory is stored in a special electronic device called a NOVARAM. This information includes the time of day, water usage amounts, daily average water usage, all programming data and the number of days since the last regeneration. When power is restored, the information is re-turned to the microprocessor and operation resumes as if an outage never occurred. The time of day will be late by the length of the power outage. Because most power outages are less than one minute in duration, it may be months or years before the time display requires resetting. If an outage of one or more hours occurs, the time of day should be reset but no other reprogramming is necessary.
- **Design Reliability.** Solid-state electronics assure many years of trouble-free performance. The metering system has only one moving part; a rotating turbine that measures water usage.
- **Time and Capacity Display.** During normal conditioning operation, the correct time of day alternates with capacity on the display. The capacity value is the number of gallons (cubic meters of metric units) of water that the unit can condition before another regeneration is needed.
- **Flow indicator.** The colon between the hours and the minutes in the Time of Day display flashes to indicate the flow of service water through the valve. This provides an easy determination of proper meter operation.
- **Hardness and Capacity Settings.** Once the hardness and capacity settings are entered, the information cannot be lost due to a power outage, so reprogramming is not necessary.
- **Guest Cycle.** An extra regeneration can be achieved at any time by pressing the REGEN button on the front panel. It takes a few minutes for the regeneration to start. The unit completes the regeneration in about two hours. This feature is beneficial when you expect to use more than the normal amount of water; for example, guest visits or an extra heavy laundry day.

General Conditioner Information

How you're Conditioner Works

In general, your water conditioner works in the following manner. Hard water flows into the conditioner and through the resin bed where calcium and magnesium hardness minerals are exchange. The conditioned water flows out of the resin bed into your plumbing system. After a certain amount of hard water has passed through the conditioner, the resin cannot remove any more minerals. This resin state is called exhaustion and indicates that the resin needs to be regenerated. The regeneration process restores the conditioner's ability to soften water. The control monitors the amount of water that flows through the conditioner and automatically calculates when to regenerate the resin bed.

Model 960 Control Front Panel

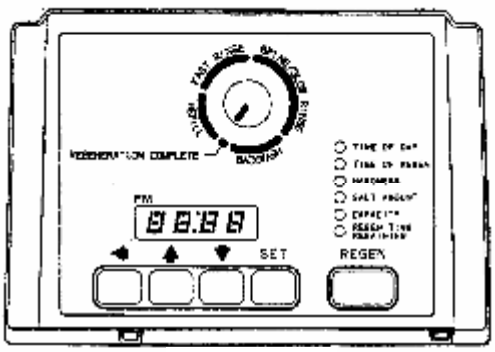


Figure 1

The main components of the model 960 Control front panel are:

- Regeneration Cycle indicator
- Green Indicator Lights
- Four-Digit Display

- Programming Push Buttons
- REGEN Push Button
- Direct acting system functions independently of water pressure. No pistons or diaphragms that require a minimum water pressure to operate

- Five-cycle operation provides for downflow conditioned water, upflow backwash, downflow brining and slow rinse, downflow fast rinse, and refill of the brine tank.

Figure 2 - Tank Adap

- Valve discs are held closed b and are leak tight. Valve seats are in a vertical position, which is the position least vulnerable to plugging.

- System operation cannot get out of phase or sequence. The control always returns to a fixed conditioned water position after regeneration.

- Bypass water is automatically available during regeneration.

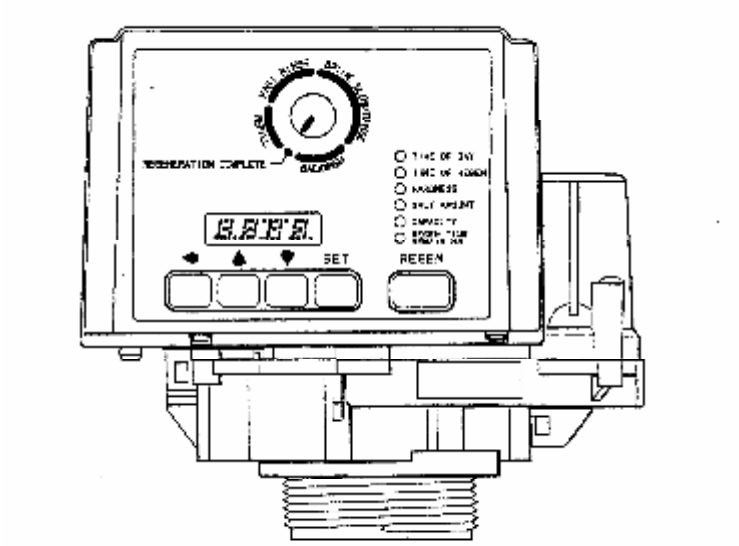
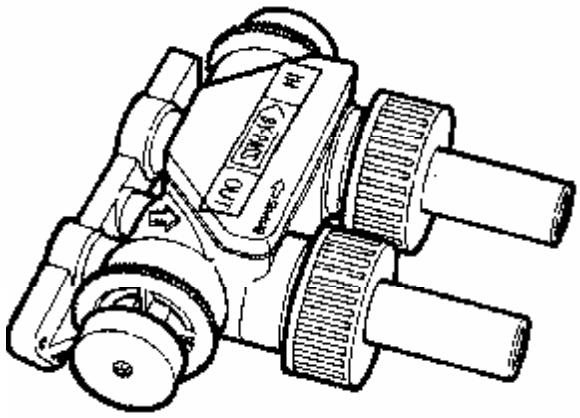


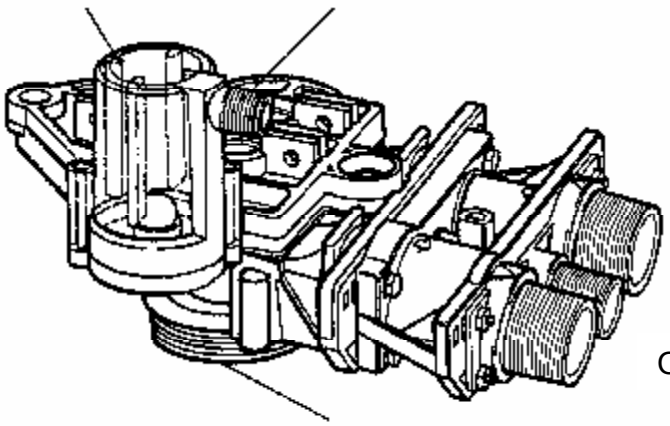
Figure 1 - Control

Bypass Valve (optional)



Air Check

Brine Tube Fitting
Connection 1/4" NPT



Inlet Connection 1" NPT or BSPT

Drain Connection 1/2" NPT or BSPT

Outlet Connection 1" NPT or BSPT

Tank Tread 2-1/2" - 8 male NPSM

Installation

All plumbing and electrical connections must conform to local codes. Inspect the unit carefully for carrier shortage or shipping damage.

Location Selection

- Locate unit as close to a drain as possible
- If supplementary water treating equipment is required, make sure that adequate additional space is available. Locate the brine tank in an accessible place so that salt can easily be added.
- Do not install any unit closer than 10ft (3m) of piping between the outlet of the water conditioner and the inlet of the water heater. Water heaters can transmit heat back down the cold water pipe into the control valve. Hot water can severely damage the controller.

A 10ft (3m) total pipe run (including bends, elbows etc) is a reasonable distance to prevent hot water damage. A positive way to prevent hot water from flowing from a heat source to the conditioner is to install a check valve in the soft water piping from the conditioner. If a check valve is installed, make sure that the water-heating unit is equipped with a properly rated temperature and pressure safety relief valve. Always conform to local codes.

- Do not locate the unit in an area where the temp ever falls below 34ºF (1ºC) or over 120ºF (49ºC).
- Do not install the unit near acid or acid fumes.
- Do not expose the unit to petroleum products.

Water Line Connection

A bypass valve system must be installed to provide for occasions when the water conditioner must is by-passed for hard water or for servicing. The most common bypass systems are the Autotrol Series 156 Bypass Valve, Figure 3, and plumbed-in globe valves, Figure 4. Though both are similar in function, the Autotrol Bypass offers simplicity and ease of operation.

Not In Bypass In Bypass

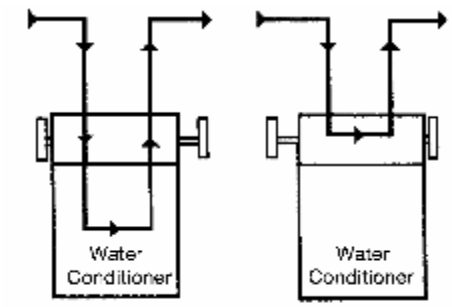


Figure 3 - Autotrol Series 156 Bypass Valve

Not In Bypass In Bypass

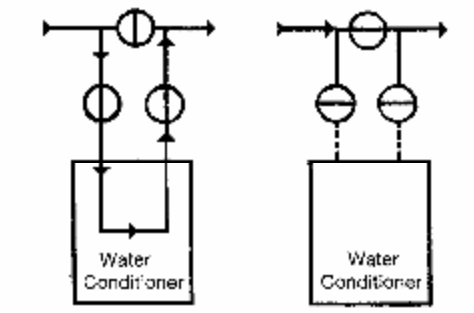


Figure 4 - Typical Globe Valve Bypass

Drain Line Connection

The ideal location for the unit is above and not more than 20ft (6.1m) from the drain. For such installations, using the appropriate adaptor fitting (not supplied), connect 1/2 in (1.3cm) plastic tubing to the drain line connection located at the rear of the control.

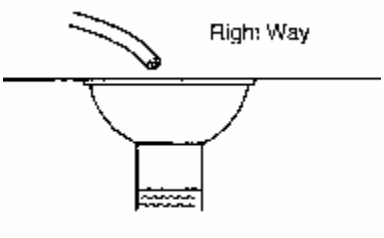


Figure 5 - Air Gap Installation

If the unit is located more than 20ft (6.1m) from the drain, use 3/4in (1.9cm) tubing for runs up to 40ft (12.2m). You may elevate the line up to 6ft (1.8m) providing the run does not exceed 15ft (4.6m) and the water pressure at the conditioner is not less than 40psi (280kPa). You may elevate an additional 2ft (61cm) for each additional 10psi (70kPa) of water pressure.

When the drain line is elevated and empties into a drain which is below the level of the control valve, form a 7 inch (17cm) loop at the drain end of the line so that the bottom of the loop is level with the drain line connection. This provides an adequate siphon trap.

If the drain empties into an overhead sewer line, a sink-type trap must be used.

Caution
Never connect the drain line into a drain, sewer line or trap. Always allow an air gap between the drain line and the wastewater to prevent the possibility of sewage being back-siphoned into the conditioner.

Refer to Figure 1 or your conditioner for the location of these features.

The front panel incorporates several important features which allow you t know the status of your water conditioner. These features are:

- **Regeneration Cycle Indicator.** The white indicator points to the status of the conditioner. Soft water is available when the indicator points to REGENERATION COMPLETE. Other positions indicate that the conditioner is regenerating the resin bed and only hard water is available.
- **Four-Digit Display.** The four-digit red LED display shows system information such as time of day, gallons of conditioned water available, time the conditioner will regenerate, or any error alarms
- **Green indicator lights.** The green indicator lights are located at the right of the control panel.
    - **TIME OF DAY**
    - **TIME OF REGEN**
    - **HARDNESS**
    - **SALT AMOUNT**
    - **REGEN TIME REMAINING**

When a green light is on next to one of the six control legends, the LED display provides information pertain-ing to that legend. When conditioned water is available, the display alternates between TIME OF DAY and CAPACITY and the corresponding green lights alternate between these control legends.

- **Programmed Push Buttons.** The programming buttons are located at the bottom of the panel under the display. Use the buttons to look at or change the conditioner settings.
- **REGEN Push Button.** The REGEN button is located at the bottom of the panel below the six indicator lights. Press the button to start a regeneration of the water conditioner.

Note: If you press the button again a minute or more after a regeneration begins, a second regeneration will start when the first regeneration is completed. The display freezes with the REGEN TIME REMAINING information. After the first regeneration is completed, the second regeneration begins immediately. The display will alternate between the TIME OF DAY and REGEN TIME REMAINING.

Control Settings

General Information

Use the four programming push buttons to change any of the control settings. Settings can only be changed if the regeneration cycle indicator is pointing at REGEN-ERATION COMPLETE. If you try to change the setting when the cycle indicator is in any other position or if the setting is not valid, the control beeps to let you know that the new setting has been ignored.

To change a setting: Press the down arrow **ò** button until the green light is illuminated next to the control setting you want to change. That control setting value shows on the display. Press the **SET** button and the far right number on the display starts flashing. If you want to change the number, press the up arrow **ñ** button to increase the number or the down arrow **ò** button to decrease the number. To skip the number without changing, press the left arrow **ï** button.

Note: If you press and hold either the up arrow **ñ** button or the down arrow **ò** button for more than 1 second, the flashing number will scroll up or down.

When the number is correct, press the left arrow **ï** button. The first number stops flashing and the next number starts flashing. You can only change the flashing number. Continue changing numbers until you reach the desired setting. Press the **SET** button. The numbers stop flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted because it was outside the range of allowable values. The old setting will be shown on the display.

Time of Day Clock

The Control uses the Time of Day Clock and the amount of conditioned water remaining to decide when to begin a regeneration. When a regeneration is necessary and the Time of Day Clock is at the same time as the Time of Regeneration setting, the control starts the regeneration.

When the green light is on next to the TIME OF DAY legend, the display is showing the time that the control thinks it is correct. If you need to change the Time of Day, refer to the instructions later in this section. The Time of Day displays time in hours and minutes sepa-rated by a colon[:]. When the colon is flashing on and off, water is flowing through the conditioner. There is a small red dot in the upper left corner near the PM letters to indicate PM for 12-hour clocks. When the dot is off, the time is AM. You can set the clock for any time, AM or PM.

Complete the following steps to change the Time of Day:

1. Press the down arrow **ò** button until the green light next to the TIME OF DAY legend is on.
2. Press the **SET** button and the minute number on the display starts flashing. If you want to change this number , press the up arrow **ñ** button to increase the number or the down arrow **ò** button to decrease the number. To skip the number without changing, press the left arrow **ï** button.
3. When the number is correct, press the left arrow **ï** button. The first number stops and the next number starts flashing. You can only change the flashing number.
4. Continue changing numbers until you reach the desired setting.
5. Press the **SET** button. The number stops flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted.

Reminder: The control does not keep time during a power outage but will resume its timekeeping from the time of day power was lost. A short power outage should not cause a problem. If the outage is several hours, the control will regenerate at the wrong time of day. All other memory is stored in the NOVRAM and maintained during power outage. Refer to page3.

Time of Regeneration

The control uses the Time of Regeneration to decide when to begin a regeneration. When a regeneration is necessary and the Time of Day Clock is at the same time as the Time of Regeneration setting, the control starts the regeneration. The factory setting for Time of Regeneration is 2:00 AM. If this time is inconvenient, you can select any other time of day. Remember that the soft water is not available during a regeneration of the water conditioner. Time of Regeneration can be set for any time, AM or PM.

Note: The control may be programmed for an immediate regeneration option. In this case, the control does not wait for the Time of Regeneration but regenerates when the remaining capacity reaches zero. Contact your dealer for more information regarding this option.

Complete the following steps to change the Time of Regeneration:

1. Press the down arrow **ò** button until the green light next to the TIME OF REGEN legend is on.
2. Press the **SET** button and the minute number on the display starts flashing. If you want to change this number, press the up **ñ** button to increase the number or the down arrow **ò** button to decrease the number.
   To skip the number without changing, press the left arrow **ï** button.
3. When the number is correct, press the left arrow **ï** button. The first number stops flashing and the next number starts flashing. You can only change the flashing number.
4. Continue changing numbers until you reach the desired setting.
5. Press the **SET** button. The number stops flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted.

Hardness Setting

The Hardness Setting refers to the amount of hardness minerals in your water before it is conditioned. The control uses this setting to calculate how many gallons of water can be conditioned before a regeneration is necessary.
Your water treatment dealer tested the water at the time of installation and entered a Hardness Setting in the control. We recommend that you consult your dealer or have your water retested before changing this setting
You can see the Hardness Setting the dealer entered by pressing the down arrow **ò** button until the green light next to the HARDNESS legend is on. The number on the display is the measure of water hardness in grains per gallon (milligrams per litre for metric).

Complete the following steps to change the Hardness Setting:

1. Press the down arrow **ò** button until the green light next to the HARDNESS legend is on. The setting range is (30 TO 2500 milligrams/litre for metric)
2. Press the **SET** button and the minute number on the display starts flashing. If you want to change this number, press the up **ñ** button to increase the number or the down arrow **ò** button to decrease the number.
   To skip the number without changing, press the left arrow **ï** button.

3. When the number is correct, press the left arrow ï button. The first number stops flashing and the next number starts flashing. You can only change the flashing number.
4. Continue changing numbers until you reach the desired setting.
5. Press the **SET** button. The number stops flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted.

Reminder: Whenever the HARDNESS or CAPACITY

- Setting is changed, you should regenerate the conditioner by pressing the REGEN button.

Salt Setting

The Salt Setting refers to the total amount of salt, in pounds, that the control uses during a regeneration of the resin bed. The amount of salt used in a regeneration determines the amount of water that the conditioner softens between regenerations. If this setting is changed, it may be necessary to change the Capacity Setting as well. Refer to Table2 for SALT and CAPAC-ITY information.

Complete the following steps to change the Hardness Setting:

1. Press the down arrow **ò** button until the green light next to the SALT legend is on. The display shows a number with a zero or a five to the right of the decimal point. No other number can be entered in this position. The setting range is (0.1 to 25.5 kilograms for metric).
2. Press the **SET** button and the minute number on the display starts flashing. If you want to change this number, press the up **ñ** button to increase the number or the down arrow **ò** button to decrease the number.
   To skip the number without changing, press the left arrow **ï** button.
3. When the number is correct, press the left arrow **ï** button. The first number stops flashing and the next number starts flashing. You can only change the flashing number.
4. Continue changing numbers until you reach the desired setting.
5. Press the **SET** button. The number stops flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted.

If the control does not display this setting, your dealer has disabled it. Some municipalities require that the Salt Setting not be adjustable. Contact your dealer for additional information.

Capacity Setting

The Capacity Setting refers to the kilograins of hardness that can be removed by the conditioner between regenerations. Your dealer entered this setting when the control was installed. Please consult with your dealer before changing this setting.

Complete the following steps to change the Hardness Setting, refer to Table 1:

1. Press the down arrow **ò** button until the green light next to the SALT legend is on. The setting range is (0.1 to 14.00 kilograms for metric).
2. Press the **SET** button and the minute number on the display starts flashing. If you want to change this number, press the up **ñ** button to increase the number or the down arrow **ò** button to decrease the number.
   To skip the number without changing, press the left arrow **ï** button.
3. When the number is correct, press the left arrow **ï** button. The first number stops flashing and the next number starts flashing. You can only change the flashing number.
4. Continue changing numbers until you reach the desired setting.
5. Press the **SET** button. The number stops flashing and the control accepts the new setting. After approximately 30 seconds, the control starts alternating the display between TIME OF DAY and CAPACITY.

Note: If a beep sounds, the new setting is not accepted.

Reminder: Whenever the HARDNESS or CAPACITY setting is changed, you should regenerate the conditioner by pressing the REGEN button.

If the control does not display the Capacity Setting, your dealer has disabled it. Some municipalities require that the Salt Setting be disabled which also disables the Capacity Setting. Contact your dealer for additional information.

Conditioner Regeneration

Your water conditioner regenerates for one of two reasons:

- The control determines that the conditioner does not have enough capacity remaining to satisfy your soft water needs for the next day.
- The REGEN button was pressed.

In either case, the REGENERATION INDICATOR makes one complete counterclockwise rotation and returns to REGENERATION COMPLETE. The indicator pauses at some or all of the different positions shown on the label around the indicator. The display alternates between TIME OF DAY and REGEN TIME REMAINING, as indicated by the green lights next to the legends. Regen Time Remaining is shown in minutes on the display. When the indicator reaches REGENERATION COMPLETE and the time remaining is zero; the regeneration is complete, conditioned water is available for use, and the control starts alternating the display between TIME OF DAY and CAPACITY. **No settings can be changed during a regeneration.** The settings can be viewed, but the control beeps and ignores any attempt to change settings.

Automatic Regeneration

The control makes regeneration decisions based on the amount of water that has flowed through the condi-tioner. The control uses the Hardness and Capacity settings to calculate the number of gallons (cubic meters for metric) which can be conditioned. At the Time of Regeneration, the control updates the average usage for the previous day and adjusts the reserve capacity accordingly. The reserve is kept at a minimum for optimal economy. The control reacts to a sudden increase in water usage. If a day's is more than double the current average, the control anticipates that a second day of high usage is likely to occur. The high usage amount is used as the reserve when the control performs the regeneration computation.

The Guest Cycle option and the Calendar Override option may override this computation. Refer to the **Additional Features** section in this manual or contact your dealer for more information about these options. The factory setting for Time of Regeneration is 2:00 AM. You can change this time. Refer to the **Time of Regeneration** section in this manual for additional information.

Manual Regeneration

To force the control to perform a regeneration, press the REGEN push button. This button is located on the front of the control. When you press the REGEN button, the control performs a full regeneration of the conditioner. You can use this feature if you need a large amount of conditioned water but the capacity remaining is low.

Note: If you press this button again a minute or more after regeneration begins, a second regeneration will start when the first regeneration is complete. The display shows the REGEN TIME REMAINING information.

Care of Your Water Conditioner

General

Check the salt level in the salt storage tank a few weeks after installation and weekly after that. Always maintain the salt level above the water level for a consistent salt dosage and proper water conditioner operation. Don't allow the conditioner to run out of salt before refilling. When refilled, the salt storage tank contains enough salt to support numerous resin bed regenerations. Use pellet, block, or nugget water conditioner salt. Do not use rock salt. Some rock salt may contain high levels of impurities, which affect conditioner operation. Have the salt storage tank serviced once a year to remove accumulated sediment that may impede brine draw.

Cleaning the Injector/Injector Screen

The injector is the component, which creates the vacuum necessary to draw the brine into the water conditioner. Clean the injector and the injector screen once a year in order to maintain proper water conditioning. Some locations may require more frequent injector and screen servicing.

Complete the following steps to clean the injector and the injector screen:

1. Unplug the wall mount transformer.

2. Shut off the water supply or put the bypass valve(s) into the bypass position.

3. Remove the rear cover by pushing back the tab provided on the cover, Next, lift the rear cover off the valve, Figure 2.

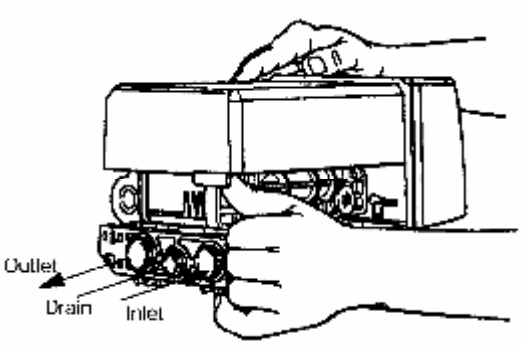


Figure 2

4. Relieve system pressure by opening the Fast Rinse Drain Valve (the fifth valve back from the control) with a screwdriver, Figure 3.

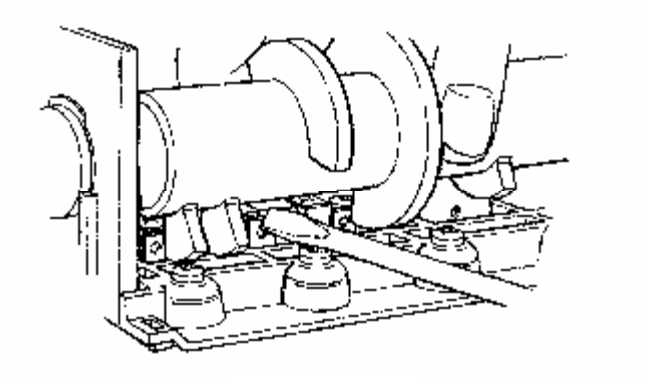


Figure 3

5. Using a screwdriver, unscrew and remove the injector screen and the injector cap, Figure 4.

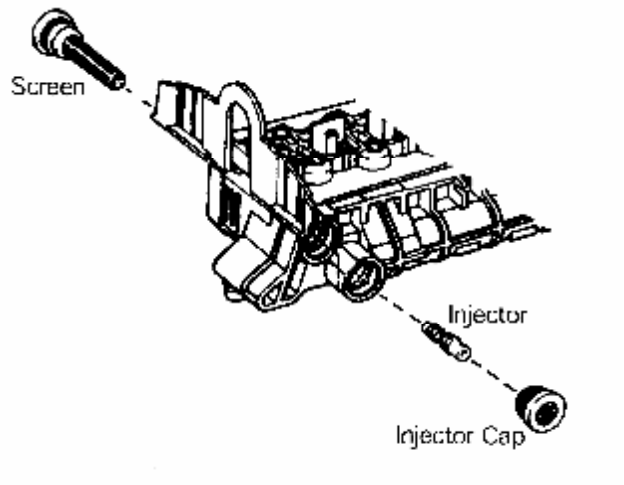


Figure 4

6. Clean the screen with a fine brush. Flush with water until clean
7. Using a needle-nose pliers, pull the injector straight out.
8. Flush water into the injector screen recess of the valve body to flush debris out through the injector recess.
9. Clean and flush the injector.
10. Lubricate the o-rings on the injector, injector cap, and injector screen with silicone lubricant (Autotrol part number 156A59).
11. Reinstall the injector, injector cap and injector screen (refer to the caution note).

Caution
Do not overtighten the plastic cap. Seat the cap lightly into position. Overtightening can cause breakage of the plastic cap, which may not be evident immediately.

12. Reinstall cover, reconnect electric power, and reset the time of day.
13. Slowly open the water supply valve or return the bypass valve(s) to the "not in bypass" position.

Maintaining the Drain Line

The drain line discharges and brine during the regeneration cycle. Typically, the line drains into your floor drain or laundry tube. The installer should plumb the drain line according to local codes, leaving a one or two inch air gap between the end of the drain line and the drain opening. Figure 5.

Be sure that the drain line remains unrestricted so the regeneration water and brine can flow freely to the drain. Do not set objects on the drain line that could crimp the line and restrict flow.

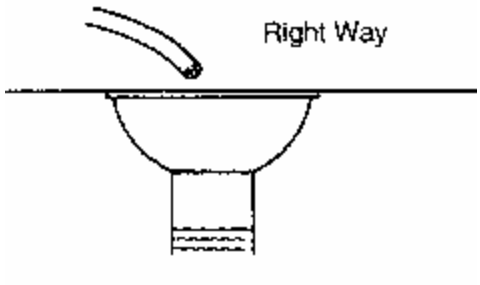


Figure 5

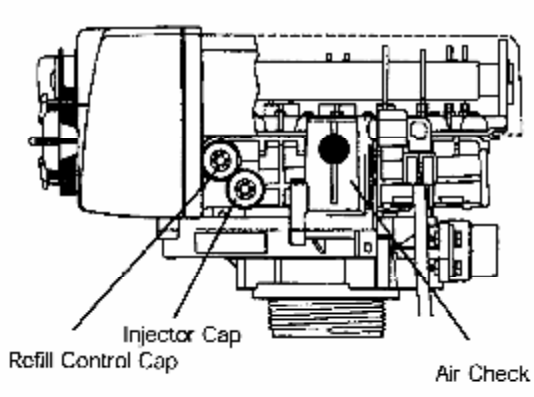


Figure 7 - Air Check

Manual Valve Operation

The camshaft may rotate manually to actuate the valve functions for service purposes.

1. Unplug the wall-mounted transformer.
2. Remove the rear cover by pulling back on the tab provided on the cover. Next, lift the rear cover off the valve, Figure 2.
3. Rotate the camshaft COUNTERCLOCKWISE until the appropriate valve is opened by the camshaft lobe. Use the regeneration cycle indicator as a guide to which valve discs are open.
4. When the service is complete, rotate the camshaft so the regeneration cycle indicator is pointing to the end of the refill cycle.
5. Reinstall cover, reconnect electric power, and reset the time of day.
6. The display will shoe Err3 and the motor will start up. After approximately 5 minutes, the indicator will point to REGENERATION COMPLETE and the control starts alternating the display between TIME OF DAY and CAPACITY.
7. The conditioner is now in operation.

Additional Features

When your dealer installs the conditioner, the control settings are adjusted to meet your soft water needs. However, there are additional features which your dealer can incorporate into the control. These features are: 12 or 24-Hour Clock, Metric Units of Measure, Calendar Override and Immediate Regeneration.

12 or 24-Hour Clock

The standard clock is a 12-hour with a PM indicator. An optional 24-hour clock without a PM indicator is available. Time can be set from 00:00 to 23:59. This option applies to both the Time of Day and Time of Regeneration settings.

Metric Units of measure

The standard units of measure are U.S. values. Hardness is in grains per gallon, Salt in pounds, and Capacity is in kilograins. The metric option changes these to milligrams per litre, kilograms, and Kilograms respectively. All controls settings use the metric values when the metric option is selected.

Calendar Override

The Calendar Override option is a method of forcing the control to regenerate after a preset number of days, is normal demand-based regeneration does not occur first. This feature is not set at the factory; your dealer can set it at 1 to 30days.

Immediate Regeneration

The control is factory set to wait until the Time of Day reaches the Time of Regeneration to begin a regeneration. Your dealer can program the controller to regenerate any time the capacity remaining reaches zero. Remember that you do not have soft water available during any regeneration.

Disinfection of Water Conditioners

The construction materials of the water conditioner system do not support bacterial growth or contaminated the water supply. However, we recommend that the conditioners be disinfected after installation and before the conditioners are used to treat potable water. In addition, a conditioner can become fouled with organic matter during normal usage or with bacteria from the water supply. Periodic disinfection is recommended for all conditioners.

Use one of the following methods of disinfection based on operating conditions, style of conditioner, type of ion exchange, and disinfectant available.

Sodium Hypochlorite

Sodium Hypochlorite, 5.25% solutions, can be used with polystyrene resin, synthetic gel zeolite, greensand, and bentonites and are available under trade names such as Chlorox, Linco, Bo Peep, White Sail and Eagle Brand Bleach. Adjust the dosage if stronger commercial solutions are used.

The recommended dosage for 5.25% solution is:

- Polystyrene resin: 1.2 fluid ounces per cubic foot.
- Non-resinous exchangers: 0.8 fluid ounces per cubic foot.

Calcium Hypochlorite

Calcium Hypochlorite, 70% available chlorine, is available in several forms including tablets and granules. These solid materials can be used directly without dissolving before application. The recommended dosage for Calcium Hypochlorite is two grains (approx. 0.1 ounce) per cubic foot.

Complete the following steps to disinfect the conditioner:

1. Add the Calcium Hypochlorite to the brine well of the brine tank. Make sure that he brine tank has

water in it so the solution is carried into the conditioner.
2. Press the REGEN button.

Note: The above instructions reflect standard commercial practices. Local codes may require different installation procedures.

Brine Line Connection

Install an appropriate fitting onto the 1/4-inch male NPT connection on the air check, Figure 7, and install a length of flexible tubing between the air check fitting and the brine pick-up tube at the brine tank.

Note: Make sure that all fittings and connections are tight so that premature checking does not take place. Premature checking occurs when the ball in the air check falls to the bottom before all brine is drawn out of the brine tank. Refer to the **Troubleshooting** section in this manual for additional information.

Brine Tank Overflow Line Connection

In the event of a malfunction, the tank overflow connection directs overflow to the drain instead of spilling on the floor where it could cause water damage. Complete the following steps to connect the overflow fitting to the brine tank:

1. Locate the fitting hole on the side of the brine tank.
2. Insert the overflow fitting (not supplied) into the tank and tighten with the plastic thumbnut and gasket as illustrated in Figure 6.
3. Attache a length of 1/2in (1.3cm) tubing (not supplied) to the fitting and run to the drain.

Note: Don not elevate the overflow line higher than 3in (7.6cm) below the bottom of the overflow fitting. Do not tie into the drain line of the control unit. The overflow line must be a direct, separate line from the overflow fitting to the drain, sewer or tube. Allow an air gap as in the drain line connection, Figure 5.

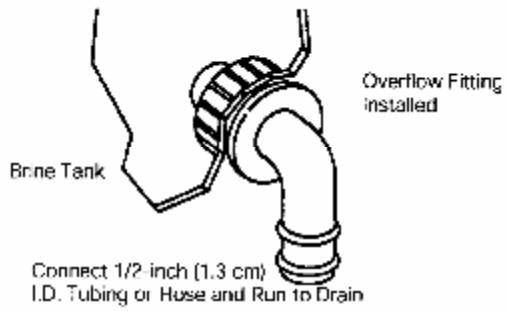


Figure 6 - Overflow Line Connection

Placing Conditioner into Operation

Initial Start-Up

After the water conditioning system is physically installed, we recommend that the conditioner be disinfected before it is used to treat potable water. Refer to the **Disinfection of Water Conditioners** section in this manual. Complete the following steps to place the conditioner into operation:

1. Remove the rear valve cover by pulling back on the tab located on the lower rear edge of the cover. Next, lift the cover off the valve.
2. Grasp the camshaft and rotate COUNTER-CLOCKWISE (As viewed from the front of the control) until the indicator on the regeneration cycle indicator points directly to the word BACKWASH.
3. Fill the mineral tank with water Turning the water supply off and place the bypass valve(s) into the "not in bypass" position. Open the water supply valve **very slowly** to approximately the 1/4 open position.

Caution

If the water supply valve is opened too rapidly or too far, resin may be lost. In the BACKWASH position, you should hear air escaping slowly from the drain line.

4. When all the air is purged from the tank (water begins to flow steadily from the drain), slowly open the main supply valve all the way. Allow the water to run into the drain until the water appears clear. Turn off the water supply and wait for about five minutes to allow all trapped air to escape from the tank.
5. Add water to the brine tank (initial fill). With a bucket or hose, add approximately 4 gallons (15 litres) of water to the brine tank.

Open the water supply valve slowly to the full open position. Carefully rotate the camshaft COUNTER-CLOCKWISE until the indicator on the regeneration cycle indicator points directly to the centre of the REFILL position and hold there until the air check (Figure 7) fills with water and water flows through the brine line into the brine tank. Do not run for more than two minutes. Rotate the camshaft COUNTERCLOCK-WISE until the indicator points to the centre of the BRINE/SLOW RINSE position.

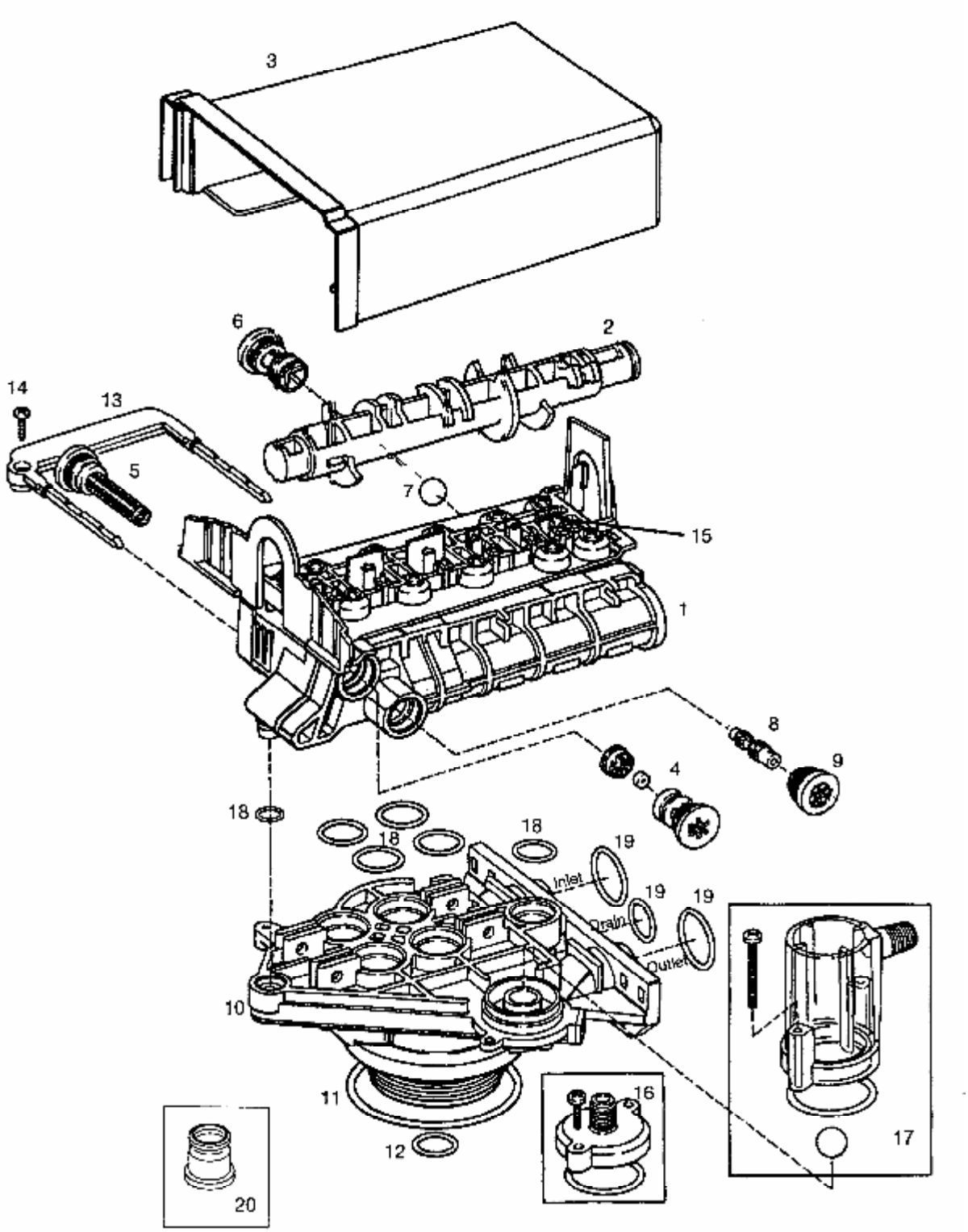
Check the water is being drawn from the brine tank. The water level in the brine tank will recede very slowly. Observe the water level for at least three minutes. If the water level does not recede, if it goes

up, or if air enters the air check sight glass and the ball falls and seats, refer to the **Troubleshooting** section in this manual.

When the water is being drawn fro the brine tank, rotate the camshaft COUNTERCLOCKWISE until the indicator points to REGEN COMPLETE. Run water from a nearby faucet until the water is clear and soft

Replacement Parts

Valve Body and Tank Adaptor Module



Valve Body and Tank Adapter Module

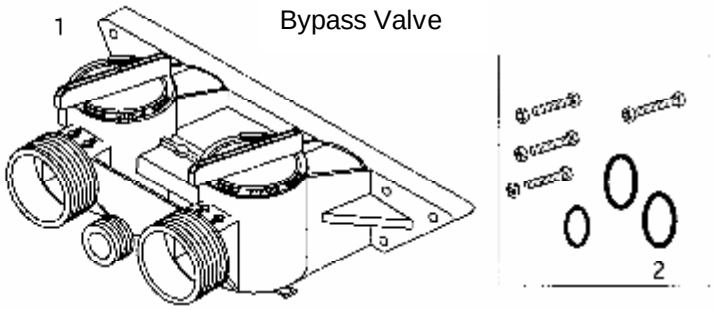
Code	Part No.	Description	Qty
1	1000238	Valve Assy. w/o Flow Controls 1	
2	1000824	Camshaft, Std, One-Piece	1
3	1000827	Valve Cover, Black	1
4		Brine Refill Flow Control Assy. :	1
	1000221	.14 GPM	
	1000223	.40 GPM	
5	1000226	Screen/Cap Assy. With O-ring	1
6		Drain Control Assy. With O-rings:	1
	1034162	No. 6 for 6 in Diameter Tank	
	1000209	No. 7 for 7 in Diameter Tank	
	1000210	No. 8 for 8 in Diameter Tank	
	1000211	No. 9 for 9 in Diameter Tank	
	1000212	No. 10 for 10 in Diameter Tank	
	1000213	No. 12 for 12 in Diameter Tank	
	1000214	No. 13 for 13 in Diameter Tank	
	1000215	No. 14 for 14 in Diameter Tank	
7	1030502	Ball, Flow Control	1
8		Injector Assy. With O-rings	1
	1032970	"A" Injector - White	
	1032971	"B" Injector - Blue	
	1032972	"C" Injector - Red	
9		Injector Cap With O-rings	1
	1000217	"A" Cap	
	1000218	"B" Cap	
	1000219	"C" Cap	

Code	Part No.	Description	Qty
10	1033784	Tank Adaptor Assy.	1
11	1010429	O-ring, 3-1/8x3-1/2x3/16 BN	1
12	1010428	O-ring, 3/4x1x1/8 EP	1
13	1031402	Locking Bar: English Language	1
14	1006093	Screw, No. 8x9/16 in1	
15	1001580	Spring, Valve Discs	9
		Kits:	
16	1033066	New to Old Air Check Adaptor	
17	1032416	Air Check Ass.	1
18	1001404	O-ring Group: Tank Adaptor	
19	1040459	O-ring Group: Piping Boss	
20	1041010	Optional Riser Insert 13/16	
*	1000250	Valve Discs Replacement (*Not Shown)	

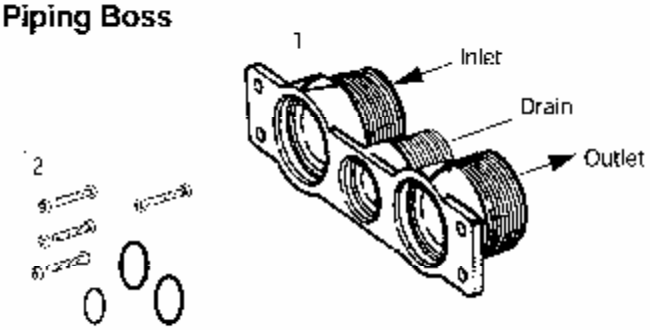
***** Not Shown

Meter Adapter Bypass Valve and Piping Boss

c

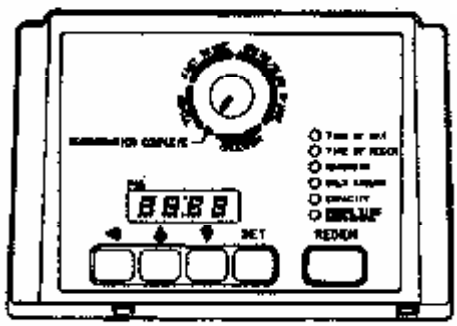


Piping Boss

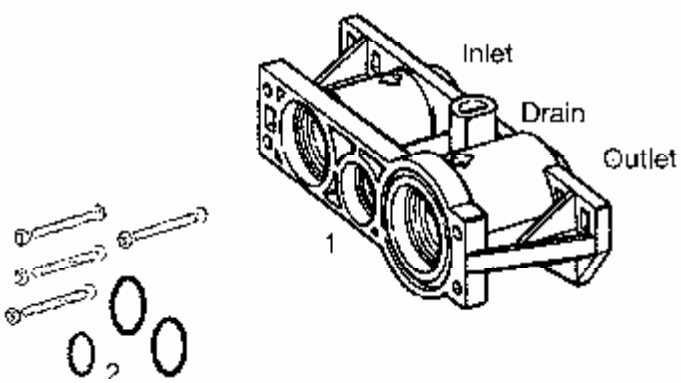


960 Control

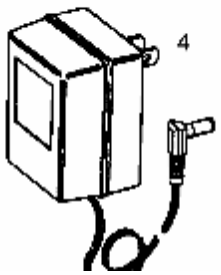
3



Meter Adapter



Wall-Mount Transformer



* Not Shown

Meter Adapter Bypass Valve and Piping Boss

Code	Part No.	Description	Qty
Bypass Valve			
1	1040769	Bypass Body Assy	1
2	1040524	Installation Kit:	
*		Plumbing Adapters	
	1001606	3/4 in Copper Tube Adaptor Kit	1
	1001670	1 in Copper Tube Adaptor Kit	1
	1001608	22mm Copper Tube Adaptor Kit	1
	1001609	28mmCopper Tube Adaptor Kit	1
	1001613	3/4 in CPVC Tube Adaptor Kit	1
	1001614	1 in CPVC Tube Adaptor Kit	1
	1001615	25mm CPVC Tube Adaptor Kit	1
	1001769	3/4 in NPT Plastics Pipe Kit	1
	1001603	1 in NPT Plastics Pipe Kit	1
	1001604	3/4 in BSPT Plastic Pipe Adaptor Kit	1
	1001605	1 in BSPT Plastic Pipe Adaptor Kit	1
	1001611	3/4 in BSPT Brass Pipe Adaptor Kit	1
	1001610	1 in NPT Brass Pipe Adaptor Kit	1
	1001612	1 in BSPT Brass Pipe Adaptor Kit	1

Code	Part No.	Description	Qty
Piping Boss			
1		Kit Piping Boss (Includes Hardware):	1
	1000083	3/4 in NPT, Brass	
	1000084	1 in NPT, Brass	
	1000085	3/4 in BSPT	
	1000086	1 in BSPT	
	1031981	3/4 in NPT, Noryl	
	1031423	1 in NPT, Noryl	
	1031982	3/4 in BSPT, Noryl	
	1030580	1 in NPT, Noryl	
2	1040339	Piping Boss Installation Kit	
*	1001408	Elbow Adapter	
Meter Adapter			
1	1032350	Kit, Meter Adapter	1
2	1032351	Installation Kit-Meter Adapter	1
3		960 or960B Electronic timer	1
4		Wall-Mount Transformer	1
	1000810	100V Japanese Plug	
	1000811	120V North American Plug	
	1000812	220V Australian Plug	
	1000813	220V British Plug	
	1000814	220V European Plug	

Troubleshooting

Your water conditioning system is designed and manufactured for efficient, low maintenance service. However, if problems do occur, this section provides a list of possible causes and solutions

Refer to table 3 to help identify the cause of a problem. You can solve some problems yourself, such as low salt in the storage tank or a blown household fuse. However, some problems require installer or

Alarms

The control continuously monitors itself and sounds an alarm if it detects something wrong. The alarm is a beep that is on for one second and then off for nine seconds. When the alarm sounds, the display shows the letter Err with a number from 1 to 4. Table 2 lists Err numbers, and solutions. To silence the alarm, press any button on the control. If the error still exists, the control will go back to the alarm condition after 30 seconds.

Caution

Service procedures that require the water pressure to be removed from the system are marked with a ! after the possible cause. To remove water pressure from the system, put the bypass valve or three-valve bypass into the bypass position and open the Rinse Drain Valve (the fifth valve back from the control) with a screwdriver, Figure 3. Restore system water pressure when the service work is completed.

Table 2 - Alarms

Indication	Description	Cause	Solution
Err1	Electronic Failure.	Control settings need reprogramming.	Contact dealer.
Err2	Improper start of regeneration (limit switch closed when it should be open).	Faulty motor, circuit board or switch. Valve camshaft has been manually rotated during a regeneration.	Attempt a manual regeneration. if error persists, contact dealer.
Err3	Improper finish of regeneration (limit switch open when it should be closed).	Faulty motor, circuit board or switch. Valve camshaft has been manually rotated out of the "regeneration complete position.	Contact dealer. Control will turn the motor on a drive camshaft back to proper location.
Err4	Improper control settings.	One or more settings out of the allowable range.	Hardness: Adjust range: 3 to 250. Capacity: Adjust range: 0.1 to 140.0 Others: Contact dealer.

Table 3 - Troubleshooting Procedures

Problem	Cause	Solution
1. Hard water at the tap.	a. Low or no salt in the salt storage tank. b. Salt setting to low to accommodate water hardness or water usage. c. Unit did not regenerate. d. Plugged injector. **!** **e.** Air check valve prematurely closed.	a. Refill the salt storage tank and manually initiate a regeneration. Refer to the **Manual Regeneration** section in this manual. **b.** Change the salt setting. Refer to the **Salt Setting** section in this manual. c. Check power. d. Clean injector and screen. Refer to the **Cleaning the Injector/Injector Screen** in this manual. Briefly put control into brine refill status. Refer to the **Manual Valve Operation** section in this manual. e. Replace or repair air check if needed. Check brine line connections.
2. Hard water leakage during service.	a. Improper Regeneration. b. Leaking of bypass valve. **!** c. O-ring around riser tube damaged. **!**	a. Check that the correct salt dosage is used. Repeat regeneration. b. Contact dealer. c. Contact dealer.
3. Loss of power to the system.	a. Transformer unplugged. b. Fuse blown, circuit breaker open, or circuit switched off.	a. Connect the power. b. Correct the electrical problem.
4. Control does not regenerate automatically.	a. Transformer unplugged. b. Defective control.	a. Plug transformer into outlet; plug transformer cable into control. b. Contact dealer.
5. Control regenerates at the wrong time of day.	a. Clock set incorrectly.	a. Reset clock. Refer to the **Time of Day** b. **Clock/Time of regeneration** sections in this manual.
6. Control does not draw brine.	a. Low water pressure b. Restricted drain line. c. Injector or injector screen plugged. **!** d. Injector defective. **!** e. Valve disc 2 and/or 3 not closed. f. Air check prematurely closed.	a. Increase water pressure. b. Remove restriction. c. Clean injector and screen, Refer to the **Cleaning the Injector/Injector Screen** section in this manual. d. Replace injector. Contact dealer. e. Manually operate valve stem to flush out foreign matter holding disc open. Briefly put control into brine refill status. Refer to the **Manual Valve Operation** section in this manual. f. Replace or repair air check if needed. Check brine line connections.
7. Intermittent or irregular	a. Low water pressure	a. Increase water pressure

9. System using more or less salt than salt control Is set for.	a. Inaccurate setting.	a. a. Make correct setting. Refer to the **salt Setting** section in this manual.
9. Control backwashes at excessively low or high rate.	a. Incorrect backwash controller. b. Foreign matter affecting controller operation. **!**	a. Contact dealer. b. Remove backwash controller. Clean and replace.
10. Flowing or dripping water At drain line after regeneration.	a. Drain valve (5 or 6) held open by foreign matter. b. Weak valve stem return spring.	a. Manually operate valve stem to flush out foreign matter holding open disc. Contact dealer. b. Contact dealer.

SPECIFICATIONS

Voltage	102 to 132 VAC, 60 Hz
Current	50 mA
Operating Temperature	34 to 120ºF (1 to 49ºC)
Humidity	10 to 100% condensing allowed
Water Meter Accuracy	0.5 to 23 gpm

Note: Wall mounted transformer is rated for indoor use only.

Glossary of Terms

Alarms

Alarms are beeps, which alert you to operating conditions requiring attention. The beeps are on for one second and off for nine seconds. The display shows the type of error. Refer to the **Alarms** section in this manual for additional information.

Backwash

An upward flow of water, which expands the resin, bed to remove foreign particles.

Brine

The salt solution which regenerates the conditioner's resin bed

Brine Draw

The process of drawing the brine solution from the salt storage tank into the resin tank.

Calendar Override Regeneration

If a normal demand-based regeneration does not occur, the Model 960 Control regenerates the system after a preset number of days. Your dealer can set this feature at 1 to 30 days.

Fast Rinse (Purge)

Hardness

A common quality of water containing dissolved calcium, magnesium and other elements. Water hardness is usually expressed in grains per gallon or milligrams per litre as calcium carbonate equivalent

Manual Regeneration (Guest Cycle)

Forces the control to regenerate by pressing the REGEN button.

Regeneration

Includes the backwash, brine draw, and fresh water rinse steps necessary to prepare the resin bed for conditioning after exhaustion. Abbreviated as "REGEN" in this manual.

Regeneration Indicator

The mechanical component which indicates the regeneration cycle status.

Resin Bed

The supply of synthetic organic exchange material used in water conditioners.

HARDNESS TEST

1. Water to be tested should be taken from a tap after the water softener

2. Measure 10ml of water into plastic bottle supplied (approximately 1/3 full)

3. Add one Yes/No tablet to sample water, replace cap and shake until tablet has completely dissolved.
   (NOTE: do not handle Yes/No tablet with fingers)

4. The final colour to be obtained for soft water is green. (Note: The shade of green may vary.) If the colour turns red, the water is above 20 mg/l hardness, therefore another regeneration is recommended.

5. Rinse plastic bottle after each test has been completed.

6. When used as above, the tablets change the colour from green to red at a hardness of approximately 20ppm based on a sample volume of 10mls.

Other hardness test kits are available for more accurate testing eg.

Hardness Tablets

Directions: Take a 50ml sample of water in a screw capped bottle. Add one (1) tablet to sample, shake or crush to disintegrate. Repeat until last trace of reddish tinge disappears. The final colour is usually blue but with some water a greyish coloured end point is obtained.

Using 50ml sample -
Hardness ppm = (number of tablets x 40) - 20

LR (BW) Tablets

Directions: Take a 100ml sample of water in a screw capped bottle. Add one (1) tablet to sample, shake or crush to disintegrate. Repeat until last trace of reddish tinge disappears. The final colour is usually blue but with some water a greyish coloured end point is obtained.

Using 100ml sample -
Hardness ppm = (number tablets x 2) – 1

Contact IBC Water if further details are required.